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## COMPLETE SPECIFICATION

**Improvements in or relating to Garbage reducing Apparatus for Attachment to a Sink.**

We, EUREKA VACUUM CLEANER COMPANY, a corporation organized under the laws of the State of Michigan, United States of America, of 6060 Hamilton Avenue, City of Detroit, State of Michigan, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

This invention relates to means adapted to be associated with the drain outlet of a sink for reducing garbage so that the same may be carried by water through a sewer system, such means being commonly referred to as garbage grinders.

In accordance with the present invention, the improved garbage reducing apparatus for attachment to a sink comprises a garbage receiving chamber provided at its discharge end with cutting teeth and a discharge outlet for reduced material, power driven rotary means for impelling material against said teeth, said rotary means comprising a hub and a hammer pivotally connected to said hub, said hammer projecting outwardly of said hub so that the outer end of said hammer may yield in a direction opposite that in which it is driven in the event its path of movement is obstructed during operation of said rotary means and said hammer in its extended position extending close to the cutting teeth without engaging the same.

According to a further form of the invention a garbage reducing apparatus for attachment to a sink comprises a frusto-conical vertically extending chamber provided at its bottom periphery with cutting teeth having openings therebetween forming a radial discharge outlet for reduced material at the level of the bottom of said chamber, power driven rotary means in the bottom of said chamber for impelling material against said teeth and for expelling material outwardly through said discharge outlet, a trough surrounding said teeth and into which said outlet opens, said rotary means comprising a hub of materially less size than the bottom of said chamber and arranged at the centre thereof, a number of radially

extending hammers, each pivotally connected to said hub, said hammers in their extended positions extending close to the cutting teeth without engaging same and adapted to swing in a plane normal to the axis of rotation of said hub, said hub and hammers being constructed and arranged so that said hammers may fold back against said hub in a direction opposite the direction of rotation thereof and leave between said hammers, when folded back, and said cutting teeth, a space having a radial distance at least as great as half of that of said chamber at the bottom thereof.

Principal objects of the invention are to provide :

A new and improved construction for a garbage grinder ;

A new and more efficient reducing means for a garbage grinder ;

A simple and efficient arrangement by means of which the grinder may be readily assembled to a sink drain ;

A novel and simple closure for a garbage grinder.

Other objects and advantages of the invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawings, of which there are three sheets and wherein :

Fig. 1 is a fragmentary sectional view of a device embodying the invention ;

Fig. 2 is a sectional view thereof taken generally along the line 2—2 of Fig. 1 ;

Fig. 3 is an enlarged sectional view of the shredding ring ;

Fig. 4 is a sectional view of the shredding ring taken generally along the line 4—4 of Fig. 2 ;

Fig. 5 is an enlarged fragmentary elevational view of the shredding ring ;

Fig. 6 is a plan view of the device separated from the sink ;

Fig. 7 is a fragmentary elevational view of the closure control ; and

Fig. 8 is a sectional view of one of the impellers taken on the line 8—8 of Fig. 2.

As illustrated in the embodiment of the invention selected for purposes of illustration, the garbage grinder comprises a frusto-

conical vertically extending chamber 10 provided at its bottom periphery with axially extending cutting or shredding teeth 12 and a series of slots 14 forming a lateral discharge for the reduced material, a collecting trough 16 surrounding the cutting teeth 12, power driven rotary hammers or impellers 18 in the bottom of the chamber 10 for impelling material against the teeth 12 and for expelling reduced material outwardly through the discharge outlet into the trough 16, and a source of power, such as an electric motor 20, for driving the impellers.

The chamber 10 may be provided by a plurality of castings 22, 24 and 26 and a shredding ring 27 in which the teeth 12 are formed. The motor 20 may be bolted to the cup-shaped lower casting member 26 and have its shaft 28 project through a suitable opening in the bottom wall 30 of the chamber 10 at the center thereof. The bottom wall 30 at the center may be recessed so as to accommodate a running seal 32 for the shaft 28.

The upper casting member 22 of the chamber 10 is formed for attachment to a drain outlet 34 of a sink 36. The casting members 22 and 24 are frusto-conical in shape so as to form a frusto-conical chamber 10. The meeting edges of the casting members 22 and 24 are separated by gasket members 40, the outer edges of which are lapped over outwardly projecting exterior flanges 42 on the casting members 22 and 24, and an annular contractible channel-shaped clamping ring 44 extends around the chamber 10 and encloses the flanges 42 as covered by the edges of the gaskets 40 so as to clamp the casting members 22 and 24 together.

It will be appreciated that the casting member 24 and the parts associated therewith may be assembled to the casting member 22 after the latter has been assembled to the drain outlet 34 of the sink.

One end of the clamping ring 44 is arranged in the shape of a bolt 46 which extends through an eye 48 on the other end of the clamping ring, and a nut 50 threaded on the bolt 46 and tightened thereon functions to tighten the clamping ring 44. Note that the sides of the clamping ring project away from each other so that as the same is tightened, the casting members 22 and 24 will be drawn together so as to clamp the gaskets 40 securely therebetween in order to establish a water-tight sealed joint.

The lower end of the casting 24 projects outwardly from the main frusto-conical portion thereof and is shaped to seat upon a complementary shaped part of the casting member 26 and to co-operate therewith so as to form the trough 16. A series of bolts 52 co-operating with tapped and threaded holes in the flanges of the casting members

24 and 26 securely clamp the same together.

Inwardly of the trough 16 the casting members 26 and 24 are formed with annular ledges 54 and 56 which provide seats for the cylindrical shredding ring 27, the upper and lower edges of which are arranged on the seats provided by the ledges 54 and 56 so that when the casting parts 24 and 26 are assembled, such shredding ring will be secured in position.

The shredding ring may comprise a ring of tempered spring steel (but not brittle) which is formed to provide a series of vertically extending cutting teeth or cutters 12 which may slope from their base to the top in a direction opposite the direction of rotation of the impellers 18. At the base of the teeth and on the level of the bottom 30 of the chamber 10, the ring is provided with a series of slots 14 which form an outlet through which reduced material from the chamber 10 is impelled by the hammers 18 into the trough 16. This outlet extends entirely around the periphery of the chamber 10 at the bottom thereof and permits the impellers 18 to function as a centrifugal pump to project reduced material and liquid outwardly through the slots 14 into the trough 16.

Several of the cutting teeth 12 may be offset inwardly about  $1/64$ th of an inch, as indicated at 60, so as to interrupt the regularity of the inner face of the shredding ring 27 in order to more effectively aid in reducing certain types of materials, such as round bones which might otherwise be pushed around the bottom of the chamber 10 ahead of the impellers 18.

The shaft 28 projects upwardly above the bottom wall 30 of the chamber 10 and has affixed thereto a hub 70 having two oppositely arranged radially extending arms 72. The inner ends of each of the hammers 18 are bifurcated so as to straddle the arm 72, and pins 74 extending through aligned holes in the hammers 18 and the arms 72 provide a pivotal connection therebetween so that the hammers 18 are free to swing in a plane normal to the axis of rotation of the hub 70 and the hammers 18. In Fig. 2 the hammers 18 are illustrated in full line position in their outer or operative position in which they are urged by centrifugal force, while they are illustrated in dotted lines 181 in their retracted or folded position. The hammers 18 are free to swing between the two positions illustrated. When in their open position the outer ends of the hammers have a slight clearance with the cutting teeth 12 as well as with the inwardly offset teeth 60. When the hammers are in their folded back position, as shown in dotted lines in Fig. 2, they and the hub form a substantially cylindrical mass thereby leaving between each of the hammers when 130

folded back and the cutting teeth 12, a space having a radial distance at least as great as half of that of the chamber 10 at the bottom thereof. In this way the hammers 18 may swing back to a folded or retracted position so as to clear objects such as bones which might become wedged in the bottom of the chamber 10 and stall the apparatus. As previously indicated, centrifugal force will tend to keep the hammers in their extended position during operation of the device.

The hammers are impellers which function to propel garbage in the bottom of the chamber 10 into engagement with the cutting teeth 12 for reducing the same, the size of the openings 14 limiting the discharge of material from the chamber 10 until the particles thereof are of such size that they may be propelled through the openings 14. In order to more effectively impel material into engagement with the teeth 12, the leading edge or face of each hammer is curved, which also helps such impellers to pass any material which might temporarily be wedged in the bottom of the chamber 10.

The impellers 18 are provided with agitating elements 80 which project upwardly from the upper surface of the impellers 18 and extend upwardly beyond the tops of the cutting teeth 12. The agitators 80 are stepped projections rising from the upper surface of the impellers 18 which serve to stir and mix the mass of material in the chamber 10 so that the same will effectively feed downwardly for action by the impellers 18. Due to the pivotal mounting of the impellers 18, the agitators 80 will occupy various positions between the axis of rotation and their outermost position and, if desired, one of the agitators 80 may be spaced farther from the axis of rotation of the hub 70 than the others. The walls of the chamber 10 above the shredding ring 27 may be provided with fluting or teeth 82.

The trough 16 terminates in a coupling member 84 which is adapted to be connected to the sewer system of the house. It is desirable to supply water continuously to the garbage grinder during the operation thereof so as to flush away the material as it is reduced.

The casting member 22 of the chamber 10 defines an inlet for the chamber which communicates with the drain outlet 34 of the sink. This inlet is adapted to be closed by a valve member or closure 90 which has a universal mounting 92 on an arm 94 fixed to a pivot shaft 96. The arm 94 is spaced from the closure 90 so that the same may rock thereon. A projection 97 and a pair of arms 98 limit the rocking movement of the closure 90 relative to the arm 94. With this arrangement, the closure member 90

will seat against a seal 100 carried by the neck of the casing member 22 and so close the drain opening when arranged as illustrated in Fig. 1. Downward movement of closure 90 permits water and/or garbage to pass from outlet 34 into chamber 10.

The shaft 96 is pivoted in suitable journals 102 formed integral with the casing member 22 and a coil spring 104 having one end connected to the shaft 96 and its other end anchored by a pin 106 is arranged to act on the shaft 96 so as to bias the closure 90 to its closed position. The shaft 96 has a cam or lever 110 affixed thereto for rotation therewith, and this cam is provided with notches 112 and 114. A roller 116 carried by an arm 118 pivoted on the pin 106 is adapted to co-operate with the notches 112 and 114 so as to hold the cam 110 and the shaft 96 and the closure 90 in either of its two positions, one in which the closure 90 is slightly open so as to pass water from the drain outlet 34 into the chamber 10, and the other in which the closure 90 is fully open so as to pass garbage through the drain outlet 34 into the chamber 10. When the closure 90 is in either of its positions just mentioned, it may be returned to its closed position by pressing down on the closure 90 sufficiently so as to move the notch 112 or 114 with which the roller 116 is engaged out of engagement therewith, and then by suddenly releasing the closure 90 the same will move to its closed position.

If desired, a link 120 may be pivoted to the cam 110 and connected to a suitable foot-operated lever 122 on the floor adjacent the sink so that by stepping on such lever the closure will open. This would provide for foot-operated or hand-operated control of the positioning of the closure 90.

The arm 118 is spring biased as shown in Fig. 7 and the roller 116 carried thereby together with the notches 112 and 114 form detent means which are selectively operable for holding the closure 90 in two positions: namely, one in which the closure 90 is slightly depressed so as to permit water to flow into the chamber 10; and the other in which the closure 90 is depressed sufficiently so as to permit the passage of garbage into the chamber 10. The actual position of the closure 90 for either of the foregoing positions will depend upon the positioning and spacing of the notches 112 and 114.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Garbage reducing apparatus for attachment to a sink comprising a garbage receiving chamber provided at its discharge end with cutting teeth and a discharge outlet for reduced material, power driven rotary means for impelling material against said

- teeth, said rotary means comprising a hub and a hammer pivotally connected to said hub, said hammer projecting outwardly of said hub so that the outer end of said hammer may yield in a direction opposite that in which it is driven in the event its path of movement is obstructed during operation of said rotary means, and said hammer in its extended position extending close to the cutting teeth without engaging the same.
2. Garbage reducing apparatus according to claim 1, wherein said hammer has a projection which projects upwardly of said hub.
3. A garbage reducing apparatus according to claim 1 or 2, wherein said cutting teeth comprise a ring of vertically extending teeth and said discharge outlet comprises spaced slots arranged between said teeth.
4. A garbage reducing apparatus according to claim 1, 2 or 3, in which a trough is arranged outwardly of said teeth for collecting and conducting away material discharged through said slots.
5. A garbage reducing apparatus according to claim 1, in which said power driven rotary means comprises a number of spaced hammers having projections which project upwardly from said hub.
6. A garbage reducing apparatus according to any of the preceding claims in which said hammers are pivoted on an axis parallel to the axis of rotation thereof.
7. Garbage reducing apparatus for attachment to a sink comprising a frusto-conical vertically extending chamber provided at its bottom periphery with cutting teeth having openings therebetween forming a radial discharge outlet for reduced material at the level of the bottom of said chamber, power driven rotary means in the bottom of said chamber for impelling material against said teeth and for expelling material outwardly through said discharge outlet, a trough surrounding said teeth and into which said outlet opens, said rotary means comprising a hub of materially less size than the bottom of said chamber and arranged at the center thereof, a number of radially extending hammers, each pivotally connected to said hub, said hammers in their extended positions extending close to the cutting teeth without engaging same and adapted to swing in a plane normal to the axis of rotation of said hub, said hub and hammers being constructed and arranged so that said hammers may fold back against said hub in a direction opposite the direction of rotation thereof and leave between said hammers, when folded back, and said cutting teeth, a space having a radial distance at least as great as half of that of said chamber at the bottom thereof.
8. A garbage reducing apparatus according to claim 7 in which said hammers are provided with upwardly projecting agitators.
9. A garbage reducing apparatus according to claim 7 in which said hammers are provided with upwardly projecting agitators intermediate the ends thereof and extending upwardly beyond the top of said cutting teeth.
10. A garbage reducing apparatus according to claim 7 in which said hammers are provided with upwardly projecting agitators and in which one of the agitators is spaced farther from the hub than the others.
11. A garbage reducing apparatus according to any of the preceding claims wherein certain of said teeth are offset inwardly from the remaining teeth of said row.
12. Garbage reducing apparatus according to claim 1 comprising a container having an inlet adapted to be connected to the drain outlet of a sink and a closure seat surrounding said inlet, a pivoted closure arranged to bear against said seat for closing said inlet, said closure being mounted in said container so as to swing inwardly into said container to open said inlet thereof, and detent means co-operable with said pivoted closure for maintaining the same open.
13. A garbage reducing apparatus according to claim 12, including means biasing said closure toward said seat, and detent means co-operable with said closure in a number of different open positions thereof.
14. A garbage reducing apparatus according to claim 12, including foot-operated means connected to said closure for moving the same to open position.
15. A garbage reducing apparatus for attachment to a sink in which the parts of said apparatus are constructed and arranged and adapted to operate substantially as hereinbefore described with reference to the embodiment shown in Figs. 1—8 of the accompanying drawings.

Dated this 4th day of June, 1945.

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[This Drawing is a reproduction of the Original on a reduced scale.]

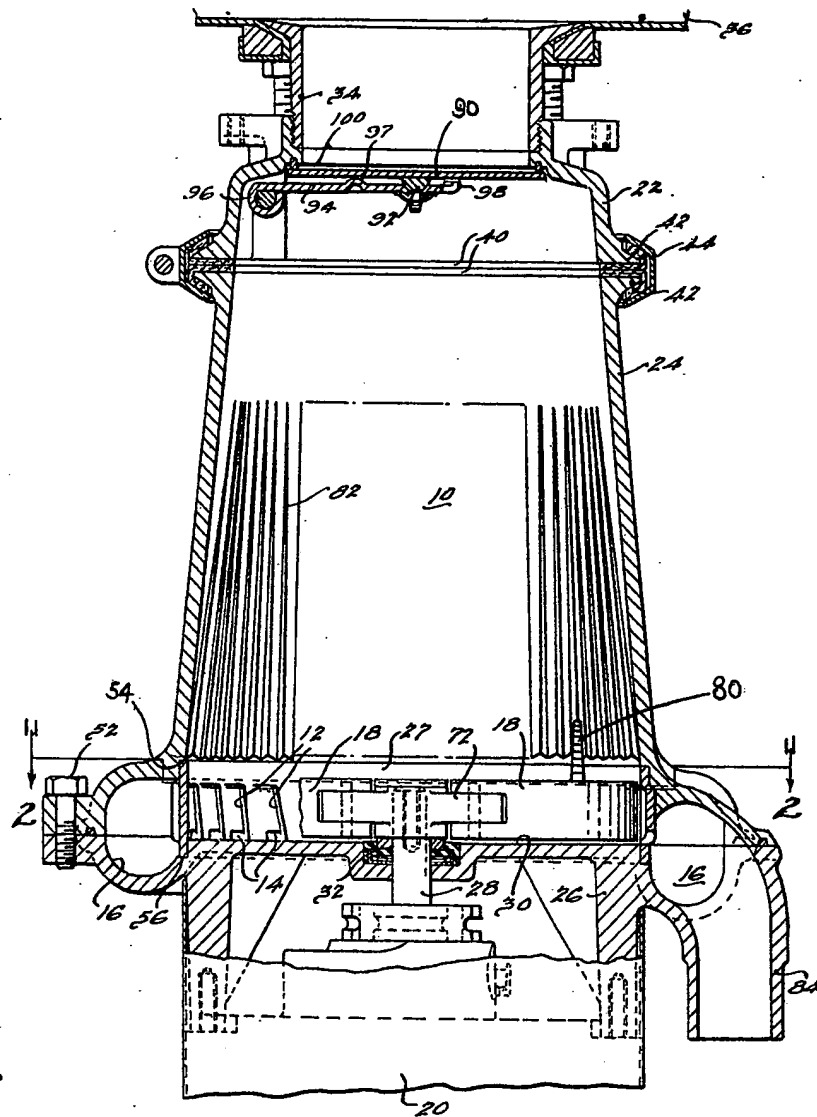


FIG. 1.

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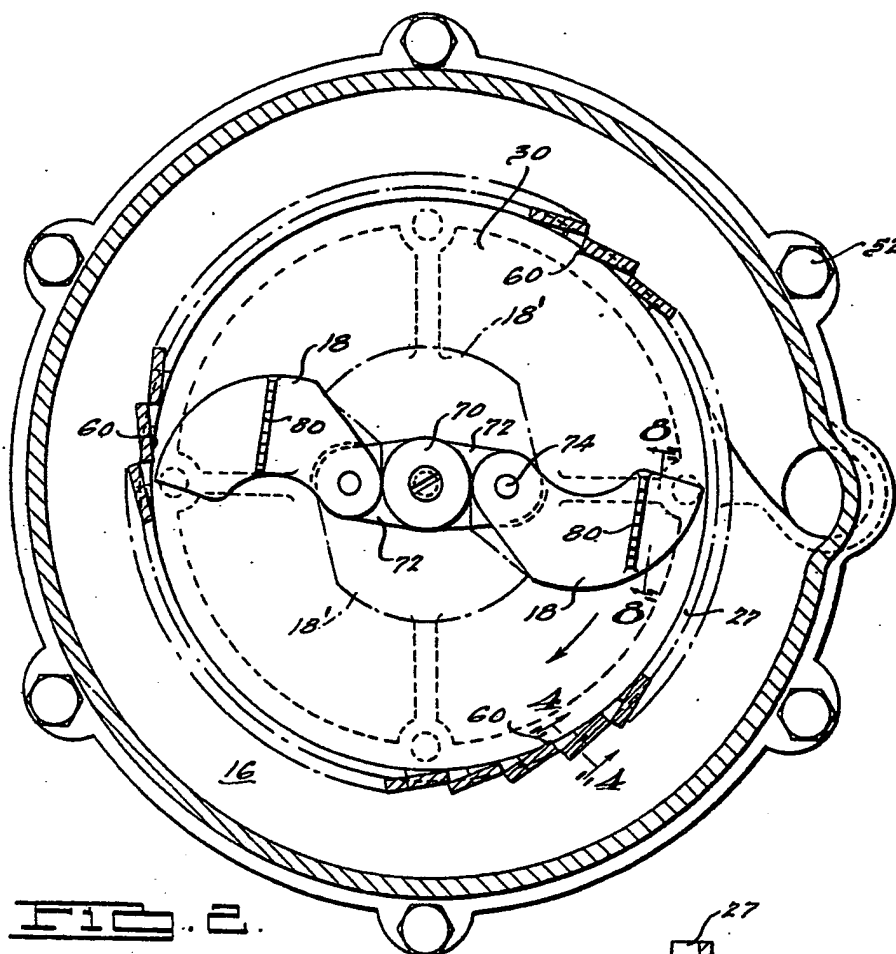


FIG. 2.

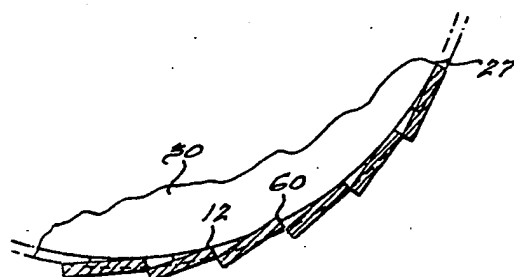
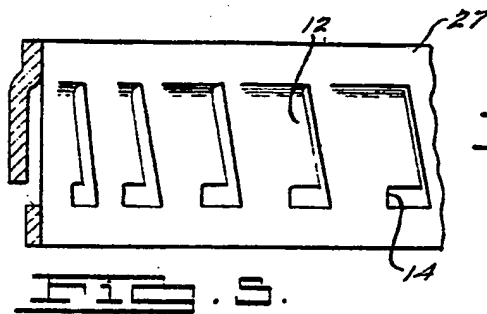
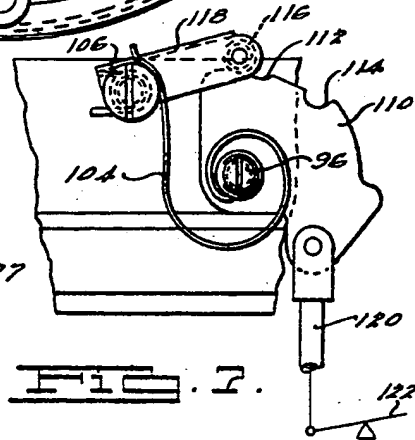
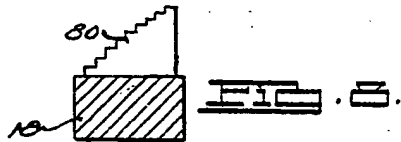
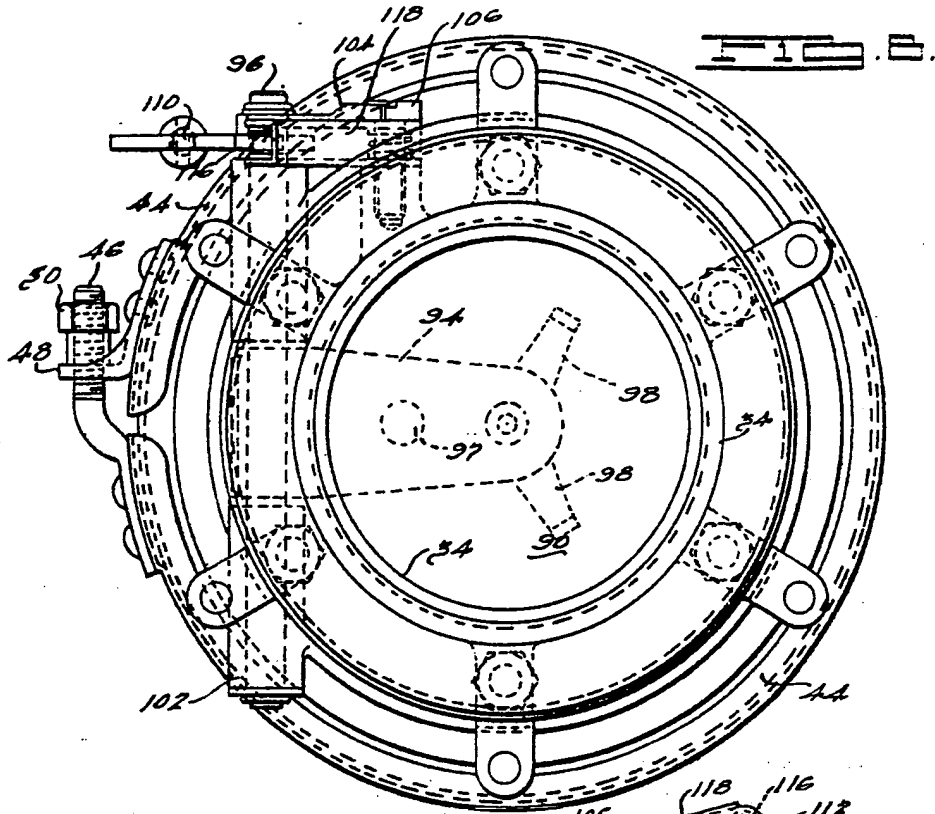
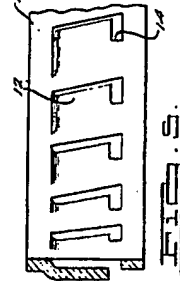
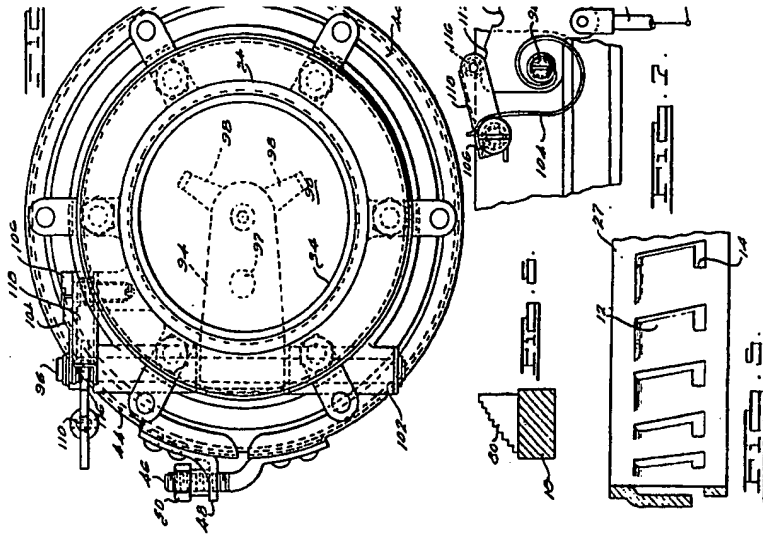
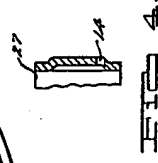
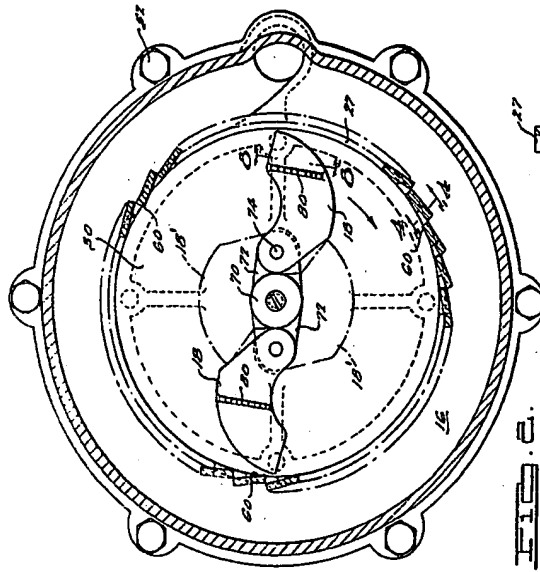


FIG. 3.



FIG. 4.





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